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THE MICRO MARSHALL HITS TOWN

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DATAMATION.

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FEATURES

24
IN FOCUS
Philipp Maranoff describes how user groups respond to "Cries for Help" from overwhelmed corporate micro users.

80
THE MICRO MARSHALL HITS TOWN
Theresa M. Engstrom
Many companies are deputizing managers to corral pc users and ride shotgun over them.

95
UNITED WE STAND
Edith Myers
A plethora of user groups help members get the most out of their PCs and out of IBM.

100
THE LONELY MICRO
T.R. Young
The darling of the computer industry is finding that unprepared and discouraged users won't play with him.

119
IN SEARCH OF ONE-MINUTE MEGATRENDS
The ground-breaking, trend-fixing, rip-snorting, hierarchy-climbing bible of the nouveau smug.

127
TECHNICALLY SPEAKING
Karen E. Horowitz
How to communicate your ideas while keeping your knees from shaking.

134
MENDACIOUS MACHINES
Tom Parret
"Intelligent" word processors may turn your memos into belles lettres.

143
TOTAL PROJECT PLANNING
Kenneth D. Meyers
An approach to easing the introduction of new products and services to a large, diversified organization.

153
A GLOBAL REACH IN THE R&D REALM
Fred Lamond
Its European and Japanese labs supply IBM with Bigger and Better.

160
TRAINING + TECHNOLOGY = PROFITS
Janet Dight
An adequate budget and a qualified and committed staff in the dp training department are the key elements in the formula for success.

NEWS IN PERSPECTIVE

32 **SUPERCOMPUTING**
Cray & CDC meet the Japanese.

42 **MICROCOMPUTERS**
IBM is closing the door.
Breaking the locks.

58 **INDUSTRIAL POLICY**
Agreeing to disagree.

60 **SOFTWARE**
Making software "easy."

71 **OFFICE AUTOMATION**
OAC figures down.

74 **EMPLOYMENT**
A bid for high-tech companies.

76 **BENCHMARKS**

DEPARTMENTS

9 **LOOK AHEAD**
15 **LETTERS**
21 **EDITORIAL**

167 **PEOPLE**
173 **HARDWARE**
181 **SOFTWARE & SERVICES**
187 **SOURCE DATA**
196 **ON THE JOB**
203 **ADVERTISERS' INDEX**
204 **MARKETPLACE**
207 **READERS' FORUM**
215 **SUBJECT INDEX**

INTERNATIONAL 166-1

- 3 **THE MIDAS TOUCH IN MANUFACTURING**
-13 **CIM AS A STRATEGIC TOOL**
-23 **INTELLIGENCE IN THE FACTORY**
-27 **AN EMPIRE STRIKES BACK**

COVER PHOTOGRAPH BY STEVE COOPER

CAD/CAM can be a golden opportunity for vendors and users alike.

THE MIDAS TOUCH IN MANUFACTURING

by Paul Tate

European industrial companies are fast discovering that CAD/CAM systems are the Midas touch they need to turn design productivity into golden profits. After a slow start, Europeans are putting cash on the line for technological tools to sharpen their competitive edge.

This trend toward automation among European industrials is creating a fast-growing market—a market that will be worth around $1.5 billion by 1987, according to California researchers Creative Strategies International. "There is now a huge wave of interest here in CAD/CAM," confirms Professor Gert Lang-Lendorff, head of the West German government's CAD/CAM laboratory in Karlsruhe. "This interest stems from a growing awareness in Europe that industrial companies must start using computers more widely to stay internationally competitive."

That awareness usually begins inside companies in the minds of management. Tim Neill, head of the U.K. consultancy CAD Source, describes the new attitude among manufacturing company managers.

"A year ago the question managers were asking was 'What is CAD/CAM?' Now they are asking 'What kind of CAD/CAM system do we need?' That is a considerable change of attitude."

Computervision's Andrew Rodgers believes there was a practical reason for this change in attitude. "The need for productivity in the industrial sector," he says, "focused the minds of senior management on the potential of automation."

Nevertheless, there is still much work to be done to get Europe's industrial sector up to speed on the technology track. In fact, at the end of 1982, only 5% of the CAD/CAM systems market in Western Europe was being satisfied, according to CSI. Over the next few years, however, the market will expand considerably. CSI forecasts annual growth rates of 38% by value and 43% by installed units through the end of 1986. CSI also predicts that the market for computer aided drafting and design (CADD) systems, which are often micro-based, will grow even faster—by around 58% in value and 62% in units by 1987. "This will give an installed base approaching 10,000 units by 1987 and a market revenue of approximately $170 million," says CSI.

Those revenues will be derived largely from West Germany, France, and the U.K.—currently the biggest national markets in Europe. The two major European CAD/CAM markets are Scandinavia, which accounted for 15% of the European market in 1982, and the Benelux countries.

Indeed, Scandinavia, despite its small population and industrial base, is one of the fastest growing CAD/CAM markets in Europe. "There is a very mature market here in Sweden," comments Nils-Holger Jansson, managing director of SMT Machine in Sweden. "There are still difficulties in evaluating the potential of CAD/CAM and there's room for more expert personnel in many industrial companies, but most organizations are aware of the new technologies, and what they can do."

SLOWER GOING IN GERMANY

In sharp contrast to Scandinavia, West Germany has been a slow mover in the CAD/CAM realm. That's expected to change as German attitudes toward industrial technology change. In fact, CSI predicts that Germany, with 32% of sales, will be Europe's largest market by 1987, when there will be around 60,000 CAD/CAM systems installed in Western Europe.

That's a lot of business for CAD/CAM vendors. An increasing number of companies, hoping to get a piece of that action, are

ENCOURAGEMENT EFFORTS

Concerned about the need to boost productivity, European governments have launched various efforts to encourage investment in new industrial technologies. One of the most ambitious programs was unveiled last year in West Germany, where the government earmarked $202.5 million for a campaign to increase R&D in the fields of CAD/CAM, robotics, and new factory automation. Under the scheme, companies get 50% funding while universities and research outfits get 100% funding on projects primarily aimed at industrial engineering development and personnel training.

Across the border in France similar subsidy programs are in the works. This support is particularly critical for the indigenous industry, which has not kept up with local demand. Indeed, the French Bureau of Information & Economic Forecasts reports that national companies are able to supply only 13% of the country's requirements for CAD systems, and only 30% of its needs for computers in industrial applications. To narrow that supply gap, the French government will dole out $13.8 million in research money over the next three years to French manufacturers of CAD/CAM systems, robots, and numerically controlled industrial equipment. Companies developing factory systems under contract will also be eligible for aid.

In 1981 the British government launched a program to increase the local manufacturing industry's awareness of CAD/CAM benefits. So far more than 18,000 firms have taken advantage of the program, which has received $15 million in further funding. Another state-backed scheme offers grants to companies wanting to buy automatic test equipment and CAD/CAM systems. Set up in 1982, this two-year, $18 million aid program has been blessed with another $7.5 million. CAD/CAM research ventures are also included in the U.K.'s Advanced Information Technology project and the European Economic Community's $1.3 billion European Strategic Program for R&D in Information Technologies (Esprit).

—P.T.

FIG. 1

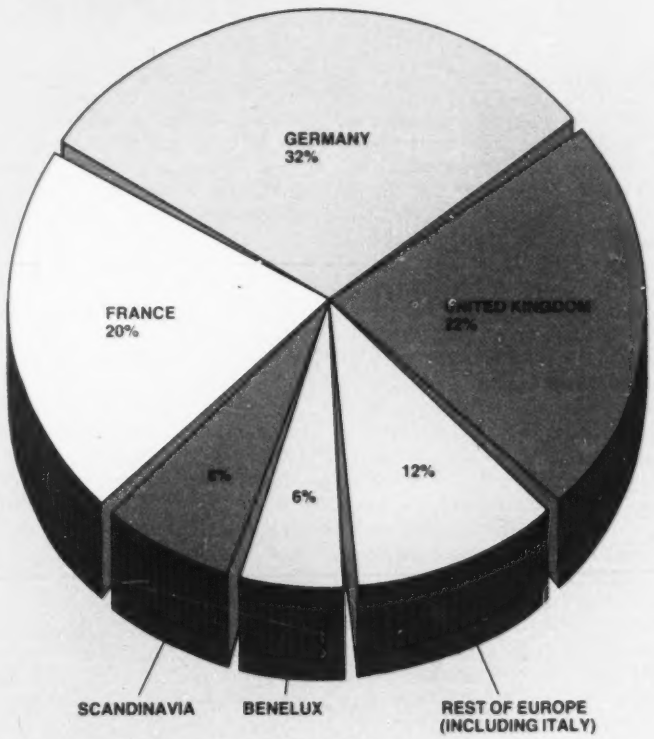
EUROPEAN CAD/CAM EQUIPMENT MARKET

Year	Value ($Million)	Annual Growth %	Units (Terminals)	Annual Growth %	Price Per Unit ($Thousand)	Installed Base
1984	556	38	6,400	46	87	20,875
1985	780	40	9,510	49	82	30,385
1986	1,092	40	14,275	50	77	44,660
1987	1,530	40	20,130	41	76	64,790

Source: Creative Strategies International

FIG. 2

1987 EUROPEAN CAD/CAM MARKET*



Source: Creative Strategies International
*Measured in revenues

entering the European arena. In the European field today there are U.S. CAD/CAM specialty firms, along with local manufacturers and software houses. Also entering the fray are the traditional computer makers.

American suppliers have dominated the world market since the late '60s, when CAD/CAM systems first became commercially available. In Europe, such U.S. companies as Computervision, Intergraph, Calma, Applicon, and Gerber, have the lion's share of the turnkey trade. All of these market leaders have a well-established presence in Europe—a presence they'd like to further enhance through local collaborations or takeovers. European software houses are a particularly good catch for U.S. vendors, since they can provide general expertise as well as local market knowledge.

One example of an American company that went the acquisition route is Computervision. The CAD/CAM king took over both Cambridge Interactive Systems in the U.K. and Grado in West Germany specifically for their software expertise.

The European vendor ranks, however, are growing. In Norway, computer maker Norsk Data is pushing into the market using its own hardware and Shape Data's Romulus 2 package. Norsk also has a research program to investigate the use of expert systems in CAD/CAM. In the U.K., which accounted for 27% of European sales in 1982, companies such as Applied Research of Cambridge, Ferranti Cetec, and Racal-Redac are building up healthy customer bases.

Still other companies throughout Europe are continuing to join the CAD/CAM cadre. Entering the market in France were Matra and Dassault. In Italy, office equipment specialist Olivetti decided to take the CAD/CAM plunge. Across the border, German giant Siemens found the field a natural follow-on product line.

Competing in the CAD/CAM market, however, may be a tough task for many of these companies. "The industrial automation market in general and the CAD/CAM market in particular are very different from the business systems market," explains Bob Bishop, international vice president of Apollo Computer. "The level of application knowledge needed to succeed in the industrial market is much higher."

For some European competitors, software may spell success. Strongly wedded to U.S. hardware, European users are beginning to look elsewhere for CAD/CAM software. Most of those select users are more sophisticated, as Apollo's Bishop points out: "There is a second generation of CAD/CAM users out there in Europe now. The level of user confidence is higher and the choice of products is wider. There is a greater readiness among users to buy hardware and software from different vendors."

Some of this readiness stems from necessity. Graphics-based CAD/CAM software, for example, must be adapted to the various European markets. This has aided the growth of a European CAD/CAM software industry, which is made up of companies that retrofit generalized software to conform to national needs. These firms also produce specialist systems for local companies.

The availability of nationally tailored packages and application-specific software products is helping open up the European CAD/CAM market. Parts of the market, of course, have been open for some time. A number of European companies were quick to catch onto CAD/CAM's potential.

EUROPEAN EARLY BIRD

One of those European early birds was British Aerospace, which automated the production of master copies of its design artwork back in 1970. In fact, most of the early CAD/CAM users were large airplane and automobile companies that could afford the heavy system costs.

Today, despite drastic improvements in the price-performance ratio of systems, many small and mid-sized European firms have still not caught on to the advantages of

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CAD/CAM. Acutely aware of this shortsightedness, European governments have launched various efforts to encourage investment in new industrial technologies (see box).

These national initiatives are not only fostering the market, they're also stimulating local developments in CAD/CAM technology. Some of this work is in areas such as expert systems, networking, and microcomputers.

The microcomputer market currently covers only CAD. Many of these existing CAD applications suffer from the performance limitations of today's micros, but these problems should be helped by the arrival of 32-bit machines. These systems, which will allow much of the existing CAD software to be downloaded from mainframes or minis, will help the micro segment of the market to grow substantially. In many applications, micros will take the place of today's specially designed graphics terminals.

Today's graphics terminals are basically standalone systems that support CAD/CAM processes such as local control of drawing commands, zoom, panning, and windowing. The future of graphics terminals, however, is closely tied to the implementation of technical standards. Core, the draft standard for 3-D terminals, has been rejected and an ANSII group is currently working on Phigs, a dynamic application program that performs hierarchial data transformations under control of a graphics generator.

One segment of the market that has yet to be satisfied is the networking of CAD/CAM systems. A study by British CAD/CAM consultancy CAD Source revealed that less than 20% of U.K. users surveyed had linked their CAD/CAM equipment to other systems. The need for networking, however, is expected to grow, since it allows designs to be transferred between systems.

In fact, networking is one of the critical factors in the integration of manufacturing systems. This concept known as computer integrated manufacturing (CIM) incorporates CAD/CAM with computer aided engineering and robotics. Standards that overcome the incompatibility of different systems are especially important for the successful implementation of CIM.

British Aerospace design manager Colin Allen, who is also president of the British Institution of Engineering Designers, believes the current incompatibility of CAD/CAM systems is a major drawback. "All the standards that now exist are relatively low level. What we need is to standardize the general systems interface. International pressure must be brought to bear on vendors to stop them from all going their own way. The CAD/CAM industry must now go along the same tortuous route as the business community has to standardize its systems. Otherwise, we as users will be held back." ❁

Some of the research for this article was supplied by Nancy Knottek, senior associate editor for international publications at Datapro Research Corp., Delran, N.J.